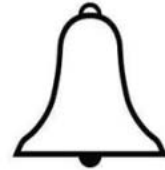


San Juan Groundwater Basin Recharge, Reclamation, & Reuse Feasibility Study

**Water SMART: Development of
Feasibility Studies under the Title XVI
Water Reclamation and Reuse Program
Funding for Fiscal Year 2014
No. R14AS00030**



Santa Margarita Water District

*Submitted by:
Santa Margarita Water District*

*Submitted to:
U.S. Department of the Interior
Bureau of Reclamation
Policy and Administration
Denver, Colorado*

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Project Title:
San Juan Basin Groundwater Recharge,
Reclamation, and Reuse Feasibility Study

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Table of Contents

1	Technical Proposal: Executive Summary	1
2.	Technical Proposal: Technical Study Description	2
3	Technical Proposal: Evaluation Criteria	7
3.1	Evaluation Criterion 1: Statement of Problems and Needs	7
3.2	Evaluation Criterion 2: Water Reclamation and Reuse Opportunities	8
3.3	Evaluation Criterion 3: Description of Potential Alternatives	10
3.4	Evaluation Criterion 4: Stretching Water Supplies	12
3.5	Evaluation Criterion 5: Environment and Water Quality	14
3.6	Evaluation Criterion 6: Legal and Institutional Requirements	17
3.7	Evaluation Criterion 7: Renewable Energy and Energy Efficiency	17
3.8	Evaluation Criterion 8: Watershed Perspective	18
4	Technical Proposal: Required Permits or Approvals	19
5	Technical Proposal: Funding Plan and Letters of Commitment	19
6	Technical Proposal: Official Resolution	20
7	Budget Proposal	21
8	Budget Narrative	22
8.1	Salaries and Wages	22
8.2	Fringe Benefits	22
8.3	Travel	22
8.4	Equipment	22
8.5	Materials and Supplies	22
8.6	Contractual	22
8.7	Reporting	23
8.8	Other	23
8.9	Indirect Costs	23
8.10	Total Cost	23
9	Budget Form SF 424A	23



1 Technical Proposal: Executive Summary

Date: May 6, 2014

Applicant Name: Santa Margarita Water District

City, County, State: Rancho Santa Margarita, County of Orange, CA

One Paragraph Summary of Proposal: The Santa Margarita Water District (SMWD) proposes the San Juan Groundwater Basin Recharge, Reclamation, and Reuse Project (Project) Feasibility Study (Study) to evaluate management options that help meet the water needs of the South Orange County region. SMWD is a member of the San Juan Basin Authority (SJBA), a joint powers authority consisting of the City of San Juan Capistrano (CSJC), the Moulton Niguel Water District (MNWD), and the South Coast Water District (SCWD) in south Orange County, CA. SMWD serves as staff for the SJBA who manages the San Juan Groundwater Basin (Basin) within the San Juan Creek Watershed, an impaired watershed that flows into the Pacific Ocean at Doheny State Beach. As a result of the region's limited groundwater supplies, the SJBA members obtain most of its water supply (about 92 percent of potable demands) from imported water sources. Currently all of SMWD's domestic water supply is imported water. Seawater intrusion threatens the Basin, which has limited hydrology and water in storage; impaired groundwater with a TDS concentration of about 2,200 mg/L; both natural and anthropogenic degradation sources; and very high concentrations of iron and manganese. Under its current management scheme, the Basin is projected to chronically fail to meet the production needs of the local agencies, as well as threaten the watershed's critical habitat and groundwater quality (including salinity concentrations due to seawater intrusion). The feasibility Study will evaluate how to increase the sustainable yield of the Basin through the enhanced recharge of stormwater and recycled water, creation of a seawater extraction barrier that will desalinate seawater and generate a new supply of water, the recharge of large amounts of recycled water and the recovery of the new recharge by expanding groundwater production facilities and treatment. The Study's scope of work includes: additional groundwater modeling to further develop spatial and temporal groundwater production plans tied to groundwater storage, underground residence time for recycled water prior to production, and recycled water contribution; expected groundwater treatment requirements to produce potable water; and the water type and cost to replace the groundwater currently used by overlying producers. A reconnaissance-level Title 22 engineering assessment will be prepared pursuant to the existing draft Title 22 regulations for a groundwater recycled reuse project (GRRP). The Study will include updated cost estimates, the locations of new wells, raw water conveyance, treatment facilities, product water conveyance, and the phasing of facilities as recycled water recharge is ramped up from an initial 2,000 acre-ft/yr to ultimately 10,000 acre-ft/yr. Of the total amount, SMWD is interested in recharging and extracting 5,000 acre-ft/yr. The Study's modeling and planning will be transferable to other similar situated basins in Southern California. The Study is needed to optimize the use of the Basin for domestic water production, including: increasing local water supply and storage, enhancing recycled water & stormwater reuse, protecting critical habitat, preventing seawater intrusion, and increasing energy efficiency by offsetting energy usage for transporting of imported water.

Length of time and estimated completion date for the proposed feasibility study: The federal funding award date, if selected, is scheduled for September 30, 2014. Based on this date, the proposed feasibility study would begin November 1, 2014 and would be completed by November 1, 2016.



2. Technical Proposal: Technical Study Description

Introductory Information

The 2013 San Juan Basin Groundwater and Facilities Master Plan (SJBGFMP) was developed through a stakeholder process to meet the water management goals of the SJBA and stakeholders. The 2013 SJBGFMP proposes six ways to manage the Basin that will result in a sustainable increase in Basin production to over 20,000 acre-ft/yr – an increase of over 100 percent. The preferred alternative includes: 1) a seawater extraction barrier near the coast where San Juan Creek discharges into the Pacific Ocean; 2) new stormwater recharge in and possibly adjacent to San Juan Creek and the Arroyo Trabuco; 3) seasonal recharge of tertiary-treated recycled water; and 4) management of groundwater production and treatment. Incorporating the seawater extraction barrier alternative and adaptive production management have been decided, and therefore, a task for preliminary alternatives development is not included in the Study's work plan tasks. The expanded yield developed will be used by the local water agencies to reduce their demand on imported water and to improve local reliability. SMWD proposes to recharge and extract 5,000 acre-ft/year out of the Basin. **The proposed Feasibility Study includes a seawater extraction barrier and adaptive production management, and will further evaluate stormwater and recycled water recharge alternatives for reuse. The Study will address the requirements of a Title XVI Feasibility Study Report, as listed in Section 4.B of the Reclamation Manual Directives and Standards.** The 2013 SJBGFMP includes some of the foundational information required to address the following Title XVI Feasibility Study components: 1) Introductory Information, 2) Statement of Problems and Needs, 3) Water Reclamation and Reuse Opportunities, and 4) Description of Alternatives. This information is expanded upon in the Final Feasibility Study Report.

SMWD will serve as the lead agency on the proposed Study. The Basin has a drainage area of over 111,000 acres and includes Oso Creek, Trabuco Creek, Horno Creek, Chiquita Canyon, Canada Gobernadora and Bell Canyon. The SJBA is designed to carry out and oversee water resource development of the Basin. The SJBA is comprised of the following member agencies: SMWD, Moulton Miguel Water District (MNWD), South Coast Water District (SCWD), and the City of San Juan Capistrano (CSJC). As set forth in the 2013 SJBGFMP, the following entities will provide an assessment and input on regulatory and feasibility issues:

- State of California Department of Public Health, Division of Drinking Water and Environmental Management District Engineer has discussed the Project with the proponents and will be included for the review of the proposed Project and groundwater recharge relative to current and proposed regulations.
- National Water Research Institute (NWRI) has been involved in similar projects in California and the southwest involving groundwater recharge of recycled water and will review key regulatory issues concerning recycled water. NWRI and SJBA have the opportunity for development of a Blue Ribbon Panel to conduct a peer review of the Project scope and findings.

Scope of Work - Tasks

Task 1 Project Management

Task 1.1 Project Management and Administration. The work completed in this task includes Project management (resourcing, scheduling, cost controls, etc.), timely invoicing, internal technical reviews, and coordination with USBR.



- The work products include progress reports and invoices.
- There are no additional specific issues or challenges.

Task 1.2 Reporting. Quarterly reporting will be conducted at the SJBA and SMWD Board meetings to brief the Boards, other stakeholders and the public on the progress of the work. In addition, reports required per the grant agreement will be prepared.

- The work products will include the following reports:
 - Quarterly Reports to the SMWD and SJBA Board of Directors.
 - SF-425 Federal Financial Report, on a semiannual basis.
 - Program Performance Report, on a semiannual basis.
 - Final Report, upon Project completion.
- There are no additional specific issues that will be investigated.

Task 2 Develop Preliminary Alternatives (Description of Alternatives) for Each Program Component

The following tasks discuss alternatives for each program component. Note that the seawater extraction barrier and adaptive production management are not included in the preliminary alternatives development tasks, as they have been selected as chosen alternatives. The seawater extraction barrier component includes the design of vertical wells for seawater extraction barriers to provide groundwater protection, sustainable production rates, and projected water quality, particularly salinity concentrations. The adaptive production management component includes developing practical spatial and temporal groundwater production plans based on storage conditions that are related to production, natural hydrologic variability, artificial recharge, and prevailing DPH and Basin Plan requirements. This includes a reconnaissance-level Title 22 engineering assessment. These Project components are discussed in the Evaluation Criterion.

Task 2.1 Develop Design Criteria, Cost Estimating Methodology and Identify Points of Delivery. The objectives of this task are: to identify and obtain agreement on facility design and operating criteria and assumptions before engineering work begins; to obtain agreement on the cost and financial assumptions to be used in the preparation of cost opinions; and identify where SMWD will take delivery and the capacity limitations at the points of delivery. The engineering team will prepare a technical memorandum (TM). The TM will subsequently be incorporated into an appendix to the Project report in Task 5.

- The work products will include a draft and final TM.
- There are no additional specific issues that will be investigated. A significant amount of relevant information is available specific to the San Juan Basin area from recent investigations, and the design and construction of similar facilities.

Task 2.2 Develop Preliminary Storm Water Recharge Alternatives. The objective of this task is to identify the range of storm water recharge alternatives overlying the Basin for detailed analysis in Task 3. The 2013 SJBGFP considered two in-stream recharge alternatives involving “T” and “L” levees as used by the Orange County Water District (OCWD) on the Santa Ana River, and a series of rubber dams. The engineering team will consider these in-stream alternatives, as well as off-stream recharge in new recharge basins and infiltration galleries located near San Juan Creek and Arroyo Trabuco. The engineering team will develop facility layouts and operating schemes for each alternative. The engineering team will rely on the 2013 SJBGFP and recent hydrology modeling work done for the Doheny Desalter investigations. The engineering team will prepare a TM that describes the storm water recharge alternatives, which will subsequently be incorporated into the Project report in Task 5.

- The work products will include a draft and final TM.



- Additional specific issues that will be investigated include: a diversion permit may need to be obtained from the SWRCB; there may be land use conflicts for recharge sites adjacent to the major storm channels; infiltration galleries may prove to be unfeasible; acquisition costs for recharge sites may be prohibitively high; and the in-stream recharge projects may impact Steelhead Trout and other habitat. The engineering team will characterize these issues and try to avoid habitat impacts through thoughtful design and suggest mitigation approaches when conflicts and constraints cannot be avoided.

Task 2.3 Develop Preliminary Recycled Water Recharge Alternatives. The objective of this task is to identify the recycled water recharge alternatives overlying the Basin and to formulate recharge alternatives for detailed analysis in Task 3. The 2013 SJBGFP considered two in-stream recharge alternatives involving a series of seasonal temporary cascading ponds in San Juan Creek and Arroyo Trabuco, as well as a series of rubber dams on the same creeks. The engineering team will consider these in-stream alternatives and off-stream recharge including recharge basins, injection wells and infiltration galleries located near San Juan Creek and Arroyo Trabuco. The engineering team will develop facility layouts and operating schemes for each alternative. The engineering team will rely on the 2013 SJBGFP, SJBA groundwater-monitoring program and planning information provided by the South Orange County Wastewater Authority (SOCWA) to formulate these alternatives. The engineering team will prepare a TM that describes the storm water recharge alternatives, which will subsequently be incorporated into the Project report in Task 5.

- The work products will include a draft and final TMs.
- Additional specific issues that will be investigated include: a live stream discharge permit from the RWQCB for in-stream recharge projects will be required; there are California Department of Public Health (DPH) requirements regarding the groundwater recycled reuse project (GRRP) projects that will need to be met; there may be land use conflicts for recharge sites adjacent to San Juan Creek and Arroyo Trabuco; acquisition costs for new recharge sites may be prohibitively high; and the in-stream recharge projects may impact Steelhead Trout and other habitat. The engineering team will characterize these issues and try to avoid habitat impacts through thoughtful design and suggest mitigation approaches when conflicts and constraints cannot be avoided.

Task 2.4 Develop a Presentation Summarizing Preliminary Program Elements. The objective of this task is to prepare a comprehensive presentation with notes to document the history of the Project and the results of Task 2.1 through 2.3 for the SMWD Board of Directors. This presentation will be used in Task 2.5 (below) and will be made available to stakeholders.

- The work product will be a presentation file that will be posted to the SMWD website.
- There are no additional specific issues that will be investigated.

Task 2.5 Review Program Elements with SMWD Board. The objective of this task is to conduct one or more workshops for SMWD's Board of Directors to summarize Task 2 results, answer questions, and to receive comments and suggestions.

- The work products will be the technical presentations, handouts, and workshop summaries, which will be posted on the SMWD website.
- There are no additional specific issues that will be investigated.



Task 3 Evaluate Feasibility of All Program Elements and Identify Proposed Title XVI Project

Task 3.1 Evaluate Groundwater Extraction Barrier Program Element Alternatives. The objective of this task is to evaluate the preliminary extraction barrier alternatives, refine them as necessary, rank them and recommend an alternative as the proposed Title XVI Project. The engineering team evaluation will include: modifying and updating a recently calibrated variable-density groundwater model and applying that model for each of the preliminary alternatives to determine extraction barrier effectiveness, sustainable yield, and expected salinity. These model results will be used to refine the operating and facilities plan including: the phasing of groundwater treatment capacity; and the preparation of a construction cost opinion and unit cost of water produced. The engineering team will prepare a preliminary recommendation for the extraction barrier alternative. The engineering team will describe the factors that contribute to uncertainty in extraction barrier performance, the investigations required to reduce the uncertainty to an acceptable level, and the cost of these investigations. The engineering team will prepare a TM that describes the evaluation of the extraction barrier alternatives, the recommended alternative and the basis of the recommendation, which will subsequently be incorporated into the Project report in Task 5.

- The work products will include draft and final TMs.
- Additional specific issues that will be investigated include: conflicting land uses at well sites, raw water conveyance and treatment facilities; Steelhead Trout and other habitat issues; and ocean brine disposal issues. The engineering team will identify these issues and try to avoid the conflicts through thoughtful design and suggest mitigation approaches when conflicts and constraints cannot be avoided.

Task 3.2 Evaluate Stormwater and Recycled Water Recharge Program Element Alternatives. The objective of this task is to evaluate the preliminary storm and recycled water recharge alternatives, refine them as necessary, rank them and recommend an alternative as the proposed Title XVI Project. The evaluation of storm and recycled water recharge alternatives were combined because many of the same types of proposed facilities are being considered for both sources of recharge water. The engineering team evaluation will include: modifying and updating a recently calibrated, fine-grain regional groundwater model and applying that model for each of the preliminary recharge alternatives to determine: recharge capacity for each type of water and combinations of water types; mounding limitations; mitigation measures that can be incorporated into the Project to maximize recharge; refining the facility and operating plans for each alternative based on model results; and preparing a construction cost opinion and unit cost of water recharged. The engineering team will prepare preliminary recommendations for the top recharge alternatives, the recommended alternative and the basis for the recommendation. The engineering team will describe the factors that contribute to uncertainty in storm and recycled water recharge performance, the investigations required to reduce the uncertainty to an acceptable level, and the cost of these investigations. The engineering team will prepare a TM that describes the extraction barrier alternatives, which will subsequently be incorporated into the Project report in Task 5.

- The work products will include draft and final TMs.
- Additional specific issues that will be investigated include those listed under Task 2.2 and 2.3.

Task 3.3 Develop a Presentation Summarizing Preliminary Program Elements. The objective of this task is to prepare a comprehensive presentation with notes to document the history of the Project and the results of Task 3.1 and 3.2. This presentation will be used at the Project workshop described in Task 3.4 (below).

- The work product will be a presentation file.



- There are no additional specific issues that will be investigated.

Task 3.4 Review Task 3 Results with SJBA Board, Other Stakeholders, DPH, SWRCB, RWQCB and USBR. The objective of this task is to conduct one or more workshops with the above-mentioned parties to summarize the results of Task 3, answer questions, and to receive comments and suggestions.

- The work products will be the technical presentations and handouts.
- There are no additional specific issues that will be investigated.

Task 4 Develop Environmental Considerations and Potential Effects

Task 4.1 Identify Potential Habitat and Environmental Opportunities for the Project Alternatives. The objectives of this task are to identify the environmental consideration that will need to be included in the planning effort, including development of preliminary cost estimates. The results will be incorporated into the Project report prepared in Task 5.

- The work products will be a study.
- Additional specific issues that will be investigated include: any identified impacts and determination on potential mitigation efforts.

Task 4.2 Develop Phasing and Monitoring Plans. The objective of this task is to develop a phased Project implementation plan. The engineering team will develop a phasing and monitoring plan based on: the work completed in Task 3; requirements from the regulatory community; funding availability; cost of alternative water supplies; the initial study findings from Task 4.1; and other considerations. The engineering team will prepare a TM that describes the proposed phasing and monitoring plans, which will subsequently be incorporated into the Project report in Task 5.

- The work products will include draft and final TMs.
- There are no additional specific issues that will be investigated.

Task 4.3 Revise Cost Opinions and Prepare Economic Analysis. The objective of this task is to revise the cost opinions and unit water cost projections based on the results of Tasks 3.3, 4.1 and 4.2. An economic analysis will be prepared for inclusion in the Feasibility Study Report. The engineering team will prepare a TM that describes the revised cost opinions. The TM will subsequently be incorporated into the Project report in Task 5.

- The work products will include draft and final TMs.
- There are no additional specific issues that will be investigated.

Task 5 Prepare Feasibility Study Report

The objective of this task is to prepare a formal Feasibility Study Report (Report) to document the technical work completed. The engineering team will prepare the Report using the following process: prepare an administrative draft report; preparation and distribution of the public review draft; public workshop to summarize the report findings, answer questions, receive comments and suggestions; and finalize and distribute final report to USBR.

- The Feasibility Study Report will comply with the Title XVI feasibility study requirements, as listed in the Section 4.B of the Reclamation Manual Directives and Standards. The following required components will be included in the Report:



- (1) Introductory Information
- (2) Statement of Problems and Needs
- (3) Water Reclamation and Reuse Opportunities.
- (4) Description of Alternatives
- (5) Economic Analysis
- (6) Selection of the Proposed Title XVI Project
- (7) Environmental Consideration and Potential Effects (including potential issues or challenges, as identified in each work plan task listed above).
- (8) Legal and Institutional Requirements (including potential issues or challenges, as identified in each work plan task listed above).
- (9) Financial Capability of Sponsor
- (10) Research Needs, if required.

- There are no additional specific issues that will be investigated

3 Technical Proposal: Evaluation Criteria

3.1 Evaluation Criterion 1: Statement of Problems and Needs

Points will be awarded based on the presence of watershed-based water resource management problems and needs for which water reclamation and reuse may provide a solution. Describe in detail the water resource management problems and needs in the area and explain how water reclamation and reuse may address those problems and needs.

The Santa Margarita Water District (SMWD), is a member of the San Juan Basin Authority (SJBA), a joint powers authority consisting of the City of San Juan Capistrano (CSJC), the Moulton Niguel Water District (MNWD), and the South Coast Water District (SCWD) in south Orange County, CA. SMWD proposes the San Juan Groundwater Basin Recharge, Reclamation, and Reuse Feasibility Study to evaluate watershed-based water resource management options to help meet the watershed's needs. The SMWD serves as staff for the SJBA who manages the San Juan Groundwater Basin (Basin) within the San Juan Creek Watershed, an impaired watershed that flows into the Pacific Ocean at Doheny State Beach. Doheny is a state designated Marine Life Refuge, State Marine Park, and State Marine Conservation Area. San Juan Creek has been listed by USFWS as having five critical habitats. The region has limited groundwater supplies and as a result, the SJBA members obtain most of its water supply (about 92 percent of potable demands) from imported water sources, which require energy for distribution and is becoming less reliable with respect to climate and regulatory impacts. Currently, all of SMWD's domestic water supply is imported water.

Seawater intrusion threatens the Basin, which has limited hydrology and water in storage; impaired groundwater with a TDS concentration of about 2,200 mg/L; both natural and anthropogenic degradation sources; and very high concentrations of iron and manganese. Under its current management scheme, the Basin is projected to chronically fail to meet the production needs of the local agencies, as well as threaten the watershed's critical habitat and groundwater quality (including salinity concentrations due to seawater intrusion). The region has developed a reliance on imported water to meet demands in excess of the underlying groundwater. The proposed Study is needed to optimize the use of the groundwater Basin for domestic water production and to protect the watershed from future impacts of limited water supply. The Study includes water reclamation and reuse to address the watershed's problems and needs by: increasing local water supply and storage, enhancing recycled water & stormwater reuse, protecting critical habitat,



preventing seawater intrusion, and enhancing energy efficiency by offsetting energy usage from transporting of imported water. The feasibility Study will evaluate how to increase the sustainable yield of the Basin through the recharge of stormwater and recycled water, creation of a seawater extraction barrier that will desalinate seawater and generate new supply of water, the recharge of large amounts of recycled water, and the recovery of the new recharge by expanding groundwater production facilities and treatment. This will provide the SJBA with about 10,000 acre-ft/yr of supplemental water recharge capacity.

3.2 Evaluation Criterion 2: Water Reclamation and Reuse Opportunities

(1) Describe how the feasibility study will investigate potential uses for reclaimed water (e.g., environmental restoration, fish and wildlife, groundwater recharge, municipal, domestic, industrial, agricultural, power generation, and recreation).

The feasibility Study will investigate potential uses for water reclamation and reuse in the study area by evaluating how to increase the sustainable yield of the Basin through the enhanced recharge of stormwater and recycled water, creation of a seawater extraction barrier that will desalinate seawater and generate new supply of water, the recharge of large amounts of recycled water, and the recovery of the new recharge by expanding groundwater production facilities and treatment. The in-stream recharge facilities used for stormwater recharge create a corridor for small summer storms to pass through the basin, and most of the channel will be bermed-off into discrete cells to receive and recharge recycled water. Recycled water will be recharged from April through October. Currently, a significant amount of recycled water is lost to the ocean due to the inability to effectively use this water. Approximately 27 acres of streambed will be used for recharge. This will provide the SJBA with about 10,000 acre-ft/yr of supplemental water recharge capacity. Groundwater production and treatment will be increased to recover this recharge. Habitat protection is a key component of the feasibility Study as water recharged into the streambed will support Steelhead Trout and other habitats. SMWD anticipates recharging and extracting up to 5,000 acre-ft/yr of the 10,000 acre-ft of additional groundwater for use in SMWD's service area.

The Study's groundwater recharge investigation will involve hydraulics and modeling to assess new in-stream and off-stream recharge and levees alternatives. Recharging the Basin using recycled water and stormwater will create new local water supply, thereby offsetting the need for imported water which will make more water available in the Bay Delta to support its habitats and will reduce energy required to transport imported water. The Study's groundwater extraction evaluation will include conducting groundwater modeling studies for groundwater protection, sustainable production rates, and projected water quality (particularly salinity concentrations). Groundwater modeling, using a recently developed groundwater model, will assess the groundwater Basin response, mounding, and the need to revise groundwater production plans to accommodate new recharge. A balance of groundwater recharge and extraction rates will be assessed to ensure the health of the Basin for reclaimed water supply. The Study will also look at habitat protection as part of the hydraulic investigation to refine the "T" and "L" levees alternative, develop hydraulic and fish passage requirements for both alternatives, and refine the stormwater recharge estimates. San Juan Creek and the Arroyo Trabuco have been listed as having Steelhead Trout habitat and the stream bottom may have other habitat values. Protecting the critical habitats within the Study area are a key component of each alternative that will be investigated. The reclaimed water will be used to service SMWD's service area, and will benefit the members of the SJBA's service area customers, which include municipal, domestic, industrial, and agricultural users.



(2) *Describe the potential water market available to use any recycled water that might be produced upon completion of a Title XVI project, as well as methods to stimulate recycled water demand and methods to eliminate obstacles for use of reclaimed water.*

The water market exists for this water as the Project's water would replace imported water as the source. The water market available to use the 10,000 acre-ft/yr of recycled water produced upon completion of the Title XVI Project includes the customers of the San Juan Basin Authority (SJBA) member agencies, which include: SMWD's service area population of over 155,000 in the Cities of Mission Viejo, Rancho Santa Margarita and the unincorporated areas of Coto de Caza, Las Flores, Ladera Ranch and Talega; MNWD's service area population of 165,000 in the cities of Laguna Niguel and portions of Aliso Viejo, Dana Point, Laguna Hills, and Mission Viejo.; SCWD's service area population of 200,000 in the Cities of Dana Point, South Laguna, San Clemente, and San Juan Capistrano; and the CSJC's service area population of 34,593 in the City of San Juan Capistrano. Methods to stimulate recycled water demand are not necessary in the Basin, as a high demand and capacity for non-potable supplies already exists. Title 22 irrigation water capacities within the Basin are about twice the current demand (14,145 acre-ft/yr) for non-potable demands. Non-potable supply is needed to meet the current demands. Some of this excess Title 22 capacity will be used to satisfy future increased non-potable demands and for indirect potable reuse thereby replacing imported water. Each agency in the SJBA owns and maintains its own recycled water distribution system. Obstacles for use of reclaimed water are not an issue in the SJBA region due to the current capacities for reclaimed water distribution and non-potable demands throughout the member agencies' service areas.

(3) *Describe the sources of water that will be investigated for potential reclamation, including impaired surface and ground waters.*

The sources of water in the San Juan Creek Watershed that will be investigated for potential reclamation for this Study include the San Juan Creek and Arroyo Trabuco, groundwater from the Basin, stormwater and recycled water. The recycled water sources include SMWD's 3A plant, Chiquita plant, and recycled water from storage. The Project alternatives that will be evaluated are located throughout the San Juan Basin within the San Juan Creek Watershed, in South Orange County. The San Juan Creek Watershed has an impaired groundwater basin with various issues including high TDS, iron and manganese concentrations. The total watershed drainage area covers approximately 175 square miles and consists of two major tributaries to San Juan Creek, known as the Arroyo Trabuco and Oso Creek, which are shown in Figure 2. As the streams come out of the canyon mouth, they widen out into several alluvial floodplains, which comprise the alluvial sediments from which groundwater is extracted. San Juan Creek is impacted by channel instability and general degradation of the environmental resources and habitat, poor surface and groundwater quality, declining water supplies, and potential loss of sand sources for coastal sand replenishment. Due to the limited local supply of domestic water, the vast majority (over 90%) of the water must be imported. The Study proposes to use stormwater and recycled water for recharge of the Basin to enhance local water supply. The proposed seawater extraction barrier includes groundwater as a source of water as a result of a seawater extraction barrier that will prevent seawater intrusion and provide up to 4,000 acre-ft/yr of potable water. The stormwater recharge component includes in-stream stormwater recharge as its source of water, using either "T" or "L" levees in the San Juan Creek, which has been listed as habitat for Steelhead Trout. The recycled water recharge component includes in-stream recycled water recharge using seasonally constructed ponds along San Juan Creek or rubber dams for its source of water. The adaptive production management approach includes recharged groundwater and associated new wells, raw water conveyance, treatment facilities, and product water as its source of water. The expanded yield of 10,000 acre-ft/yr developed by the



proposed Project will be used by the local water agencies to reduce their demand on imported water, as well as enhance local supply reliability and sources of reclaimed water.

3.3 Evaluation Criterion 3: Description of Potential Alternatives

(1) Describe the objectives all alternatives will be designed to meet. What other water supply alternatives will be investigated as part of the Title XVI feasibility study?

As identified in the 2013 SJBGFMP, the objectives all alternatives will be designed to meet include: increase the production capacity of the Basin during non-wet periods, prevent seawater intrusion, increase the yield of the Basin through the inducement of more stormwater recharge, and increase the yield through the recharge of large amounts of recycled water. The yield of the Basin will be increased from about 10,000 acre-ft/yr to about 20,000 acre-ft/yr—an increase of about 10,000 acre-ft/yr. SMWD will recharge and extract up to 5,000 acre-ft/yr. The Project components listed below are considered alternatives, and are shown in Figure 1. The alternatives and their corresponding objectives are defined below. Note that the seawater extraction barrier and the adaptive production management alternatives have been selected as project components, whereas the stormwater and recycled water recharge and habitat protection alternatives will be decided as part of the feasibility study.

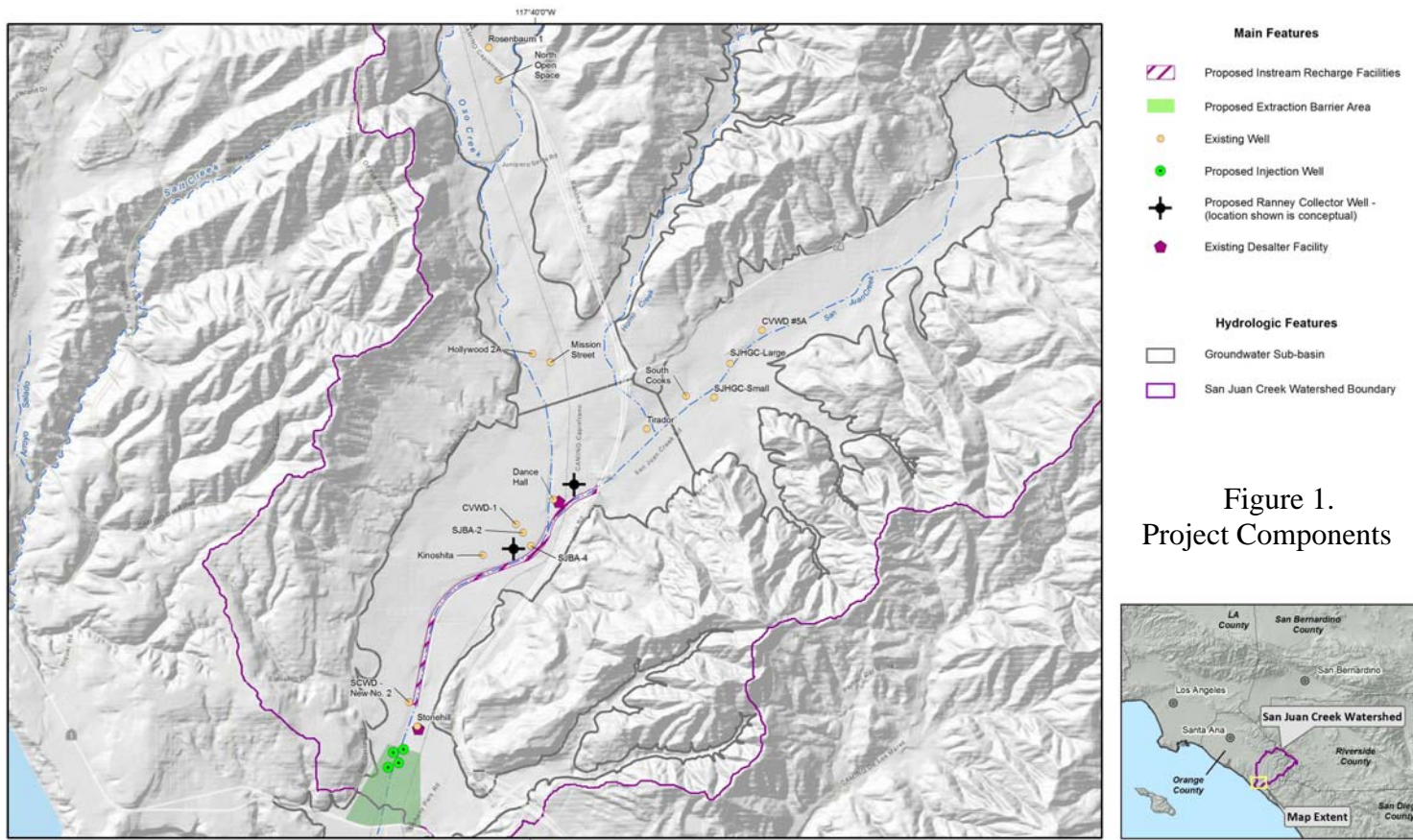
- Seawater Extraction Barrier Objectives: Design vertical wells for seawater extraction barriers to provide groundwater protection, sustainable production rates, and projected water quality, particularly salinity concentrations. Provide up to 4,000 acre-ft/yr of potable water.
- Stormwater Recharge & Habitat Protection Objectives: Complete in-stream stormwater recharge using either “T” and “L” levees, as utilized by the Orange County Water District (OCWD); rubber dams for in-stream recharge; and rubber dams for in-stream recharge and diversion to off-stream recharge facilities. Increase in recharge anticipated by the “T” and “L” levees alternative from 500 to 2,000 acre-ft/yr and for the rubber dam alternative from 1,000 to 4,000 acre-ft/yr and protect San Juan Creek and the Arroyo Trabuco fish habitat.
- Recycled Water Recharge Objectives: Accomplish in-stream recycled water recharge using seasonally constructed ponds along San Juan Creek or rubber dams. Produce 2,000 acre-ft/yr and eventually reach about 10,000 acre-ft/yr.
- Adaptive Production Management Objectives: Develop practical spatial and temporal groundwater production plans based on storage conditions that are related to production, natural hydrologic variability, artificial recharge, and prevailing DPH and Basin Plan requirements. A reconnaissance-level Title 22 engineering assessment will be prepared. Complete an updated facilities and operating plan. Increase recycled water recharge from 2,000 to 10,000 acre-ft/yr, as noted above.

The 2013 SJBGFMP was developed through a stakeholder process and introduces the proposed Project’s components to manage the Basin for a sustainable water supply increase in Basin production. Many alternatives, other than those listed above, were investigated as part of the 2013 SJBGFMP development. With the exception of the seawater extraction barrier and the adaptive production management, the alternatives listed above will be investigated as part of the Title XVI feasibility study. The seawater extraction barrier and adaptive production management have been chosen alternatives as Project components.



(2) Provide a general description of the proposed project that will be the subject of a Title XVI feasibility study.

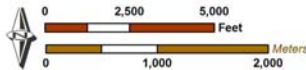
A general description of the proposed Project that will be the subject of a Title XVI feasibility Study includes: The proposed Project incorporates large-scale recycled water recharge and subsequent indirect potable reuse to develop a new source of potable water for the SJBA service area. Specific Study components include: a seawater intrusion barrier, in-stream stormwater recharge facilities, and adaptive production management. In the Project, natural and recycled water recharge will comingle in the groundwater Basin, be recovered at wells, and be treated prior to use. Up to 10,000 acre-ft/yr of recycled water will be recharged in this Project, starting at 1,000 acre-ft/yr and gradually increasing to full capacity. The additional stormwater recharge from in-stream recharge facilities will dilute and partially offset the salt load from the recycled water. The existing groundwater treatment facilities will have to be expanded or new facilities built to treat the additional 10,000 acre-ft/yr of new recharge created in this alternative. The type of treatment anticipated is a combination of iron and manganese removal and reverse osmosis with an overall recovery of 80 percent. The yield of the Basin with all components in will be increased from about 10,000 acre-ft/yr to about 20,000 acre-ft/yr—an increase of about 10,000 acre-ft/yr. SMWD will recharge and extract up to 5,000 acre-ft/yr.



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Management Components

Figure 6-1



(3) Describe alternative measures or technologies for water reclamation, distribution, and reuse that will be investigated as part of the Title XVI feasibility study.

Alternative measures or technologies for water reclamation, distribution, and reuse that will be investigated as part of the Title XVI feasibility study include innovative approaches to desalination, stormwater recharge, recycled water recharge, groundwater extraction, and adaptive management as discussed above in question (2). These alternatives were identified in the 2013 SJBGFMP for sustainable, long-term management of the San Juan Basin. The proposed Project takes the tools that have been historically applied to larger basins and applies them to a smaller basin with the goal of producing a new sustainable water supply. The Study will look at the alternative measures of using stormwater and recycled water recharge, and groundwater extraction in a small basin with impaired groundwater quality for reclamation and reuse. Revisions to existing diversion permits to provide alternative water supplies, and to include the right to divert, recharge, and store new stormwater recharge for recovery, will require coordinate with DPH to establish DPH GRP regulations.

The seawater extraction barrier component involves conducting groundwater modeling studies, utilizing a recently (2013) calibrated model of the coastal zone of the San Juan Basin, to investigate extraction barrier well locations, sustainable production rates, and projected salinity concentrations. The stormwater recharge component involves conducting a hydraulic investigation to refine the “T” and “L” levee alternatives and develop hydraulic and fish passage requirements for both alternatives, and refine the stormwater recharge estimates. A recently developed groundwater model will be used to assess the Basin response, mounding and the need to revise groundwater production plans to accommodate new recharge. The recycled water component includes the hydraulic investigation to refine the layout and operation of the temporary seasonal recharge ponds, develop hydraulic and fish passage requirements, and refine the recycled water recharge estimates for the alternatives. A recently developed groundwater model will also be used with this component for indirect use analysis. Alternative groundwater modeling will be used to develop spatial and temporal groundwater production plans tied to groundwater storage, underground residence time for recycled water prior to production, and recycled water contribution; expected groundwater treatment requirements to produce potable water; and the water type and cost to replace the groundwater currently used by overlying producers. The data developed as a result of the Project components may be applied to other watersheds.

3.4 Evaluation Criterion 4: Stretching Water Supplies

Points will be awarded based on the extent to which the proposal demonstrates that the Title XVI feasibility study will address activities that will help to secure and stretch water supplies.

(1) Describe the potential for the project to reduce, postpone, or eliminate the development of new or expanded water supplies. Include description of any specific issues that will be investigated or information that will be developed as part of the Title XVI feasibility study.

The potential for the Project to reduce, postpone, or eliminate the development of new or expanded water supplies is high. Currently, the SJBA depends on imported water to meet the vast majority of the demands of its service area. The proposed Project alternatives will significantly reduce the need for the development of new water supplies by stretching the existing available local supplies and reducing imported water volumes. Using stormwater and recycled water to recharge the Basin for reclamation and reuse will provide increased local supply. The stormwater recharge & habitat protection component will accomplish in-stream recharge



and diversion to off-stream recharge facilities, thereby increasing recharge for the levees alternative from 500 to 2,000 acre-ft/yr and for the rubber dam alternative from 1,000 to 4,000 acre-ft/yr. The issues that will be explored and mitigated include obtaining a diversion permit from the State Water Resources Control Board (SWRCB), land use conflicts for recharge sites adjacent to major storm channels, feasibility of infiltration galleries, acquisition costs for recharge sites, Steelhead Trout habit impacts. The recycled water recharge component will accomplish in-stream recycled water recharge using seasonally constructed ponds along San Juan Creek or rubber dams. This will produce 2,000 acre-ft/yr and eventually reach about 10,000 acre-ft/yr and the issues that will be explored and mitigated include obtaining a live stream discharge permit from the RWQCB for in-stream recharge, DPH Health requirements GRRP projects, land use conflicts for recharge sites, acquisition costs, and in-stream recharge impacts on Steelhead Trout habitat. The adaptive production management component will develop practical spatial and temporal groundwater production plans based on storage conditions that are related to production, natural hydrologic variability, artificial recharge, and prevailing DPH and Basin Plan requirements. This component will increase recycled water recharge from 2,000 to 10,000 acre-ft/yr and the issues that will be explored and mitigated include conflicting land uses at well sites, raw water conveyance, and compliance with DPH GRRP regulations. SMWD plans to recharge and extract up to 5,000 acre-ft/yr of water for reuse. The seawater extraction barrier component will provide up to 4,000 acre-ft/yr of potable water, and issues that will be explored and mitigated include land uses as well sites, raw water conveyance and treatment facilities, and Steelhead Trout habitat, and ocean brine disposal. In total, the Project will recharge up to 10,000 acre-ft/year of recycled water and the total yield will be about 20,000 acre-ft/year (an increase of 10,000 acre-ft/year over baseline conditions).

- (2) Describe the potential for the project to reduce or eliminate the use of existing diversions from natural watercourses or withdrawals from aquifers. Include description of any specific issues that will be investigated or information that will be developed as part of the Title XVI feasibility study.

The potential for the Project to reduce or eliminate the use of existing diversions from natural watercourses or withdrawals from aquifers is substantial. The Basin is limited by hydrology, water in storage, impaired groundwater with high TDS concentration, natural and anthropogenic degradation sources, and very high concentrations of iron and manganese. Groundwater desalters are currently used to treat the groundwater that is produced. Due to limited groundwater supplies, the SJBA members obtain most of its water supply (about 92 percent of potable demands) from imported water sources from Municipal Water District of Orange County who receives the supply from the Metropolitan Water District of Southern California, a state water project. Table 1 lists the estimated total water demand for each SJBA agency and the amount of water supplied from imported, recycled and native sources for fiscal 2010.

Table 1 Water Demand and Supply within SJBA Service Area

Water Agency	Total Water Demand (acre-ft/yr)	Water Supply (acre-ft/yr)		
		Native Potable Water	Recycled/ Non-Potable Water	Imported Water
MNWD	36,593	-	6,858	29,735
CSJC	8,783	1,980	434	6,379
SMWD	34,169	65	6,027	28,077
SCWD	6,909	634	826	5,449
Total	86,454	2,679	14,145	69,640

By increasing the Basin production up to 10,000 acre-ft/year, the imported water currently relied upon to meet demands will be significantly reduced, thereby reducing diversions from the State Water Project and making more water available to the Bay Delta region. More water will be made available to feed into the supply at San Juan Creek and Arroyo Trabuco to support the watershed's



ecosystem and habitat. Issues that will be investigated for each Project component are discussed in question (1) above.

- (3) Describe the potential for the project to reduce the demand on existing Federal water supply facilities. Include description of any specific issues that will be investigated or information that will be developed as part of the Title XVI feasibility study.*

The potential for the Project to reduce the demand on existing Federal water supply facilities is high. In its current state, the San Juan Basin: can sustain on average about 9,300 acre-ft/yr of production, which will range from about 7,700 to about 11,200 acre-ft/yr, limited by hydrology and water in storage; has a storage capacity of about 40,000 acre-ft and currently has about 27,000 acre-ft in storage. Imported water supplies the majority of the SJBA service area's potable water demand at about 69,600 acreft/yr, compared to the 2,700 acre-ft/yr produced from the Basin. SMWD will produce up to 5,000 acre-ft/yr and the the larger Project will produce up to 10,000 acre-ft/year of recharged water, significantly reducing its reliance on SWP supplies and making more water available for the Bay-Delta. The reduction in demand for SWP supplies will assist the Bay-Delta by: ensuring water supply reliability in the supplies within the Delta, improving and safeguarding the Delta's water quality, and restoring the Delta's ecosystem by protecting the habitat of native species. The State of California has established a policy for reduced reliance on the California Bay-Delta for water supplies and mandated regional self-reliance. The new water code assists with the preservation of state and federal goals for the Bay-Delta; this Project contributes to those goals and also addresses the need for regional self-reliance through stopping groundwater degradation by reclaiming water and reusing it for local supply. Issues that will be investigated for each Project component are discussed in question (1) above.

3.5 Evaluation Criterion 5: Environment and Water Quality

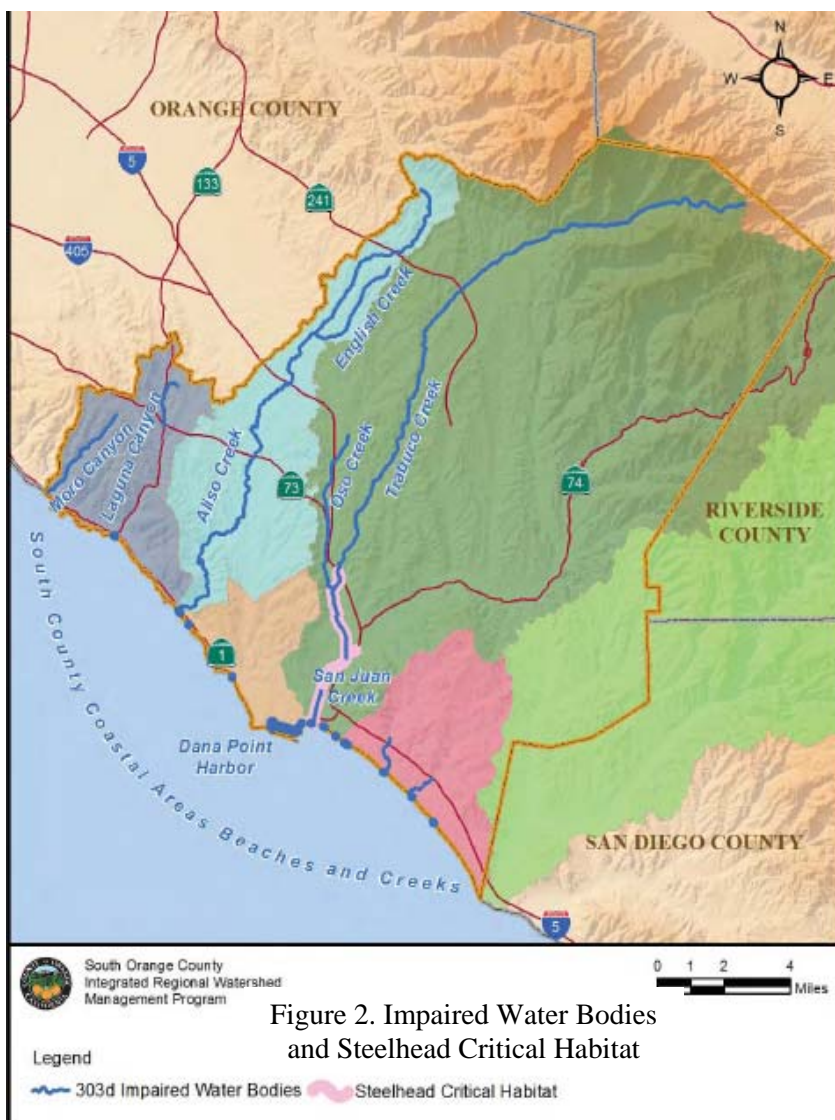
- (1) Describe the potential for the project to improve the quality of surface or groundwater, including description of any specific issues that will be investigated or information that will be developed as part of the Title XVI feasibility study.*

The Project will improve the quality of surface and groundwater for the San Juan Creek Watershed, Arroyo Trabuco, and the San Juan Basin, as shown in Figure 2. San Juan Creek is impacted by channel instability and general degradation of the environmental resources and habitat, poor surface and groundwater quality, declining water supplies, and potential loss of sand sources for coastal sand replenishment. The San Juan Basin is an impaired groundwater basin with both natural and anthropogenic degradation sources, high TDS (concentration of about 2,200 mg/L), iron and manganese concentrations. Currently groundwater desalters are used to treat the groundwater. It is assumed that by recharging good quality water into an impaired aquifer, the water quality subsequently extracted from the aquifer will improve. Additional modeling of the aquifer with multiple infiltration points will assist in confirming this assumption as it applies to this type of basin. The seawater extraction barrier will prevent seawater intrusion and protect groundwater. Information that will be developed as part of the Study includes groundwater modeling on the effectiveness of extraction barriers to provide groundwater protection, sustainable production rates, and projected water quality, particularly salinity concentrations.

The water recharge components will use stormwater and recycled water, respectively, to recharge the groundwater Basin, offsetting the demand on imported water supply. This will enhance the quality of the groundwater and surface water of the San Juan Creek for the Steelhead Trout habitat. The information that



will be developed for these components includes a hydraulic investigation for the “T” and “L” levees, hydraulic fish passage requirements, and stormwater/recycled water recharge requirements. The adaptive management component will improve the quality of groundwater and surface water by reducing seawater intrusion. The mode of operation limits production (diversion) when groundwater storage falls to less than half of the storage capacity (a provision included to protect other groundwater producers), which is predicted to occur about 71 percent of the time. Information that will be developed includes groundwater modeling to develop spatial and temporal groundwater production plans tied to groundwater storage, underground residence time for recycled water prior to production, and recycled water contribution; expected groundwater treatment requirements to produce potable water; and the water type and cost to replace the groundwater currently used by overlying producers. A reconnaissance-level Title 22 engineering assessment will be prepared pursuant to the existing draft Title 22 regulations for a groundwater recycled reuse project. The groundwater and stormwater quality is anticipated to drastically improve by increasing the amount of water recharge and thereby improving the quality of groundwater in the Basin.



(2) Describe the potential for the project to improve flow conditions in a natural stream channel, including description of any specific issues that will be investigated or information that will be developed as part of the Title XVI feasibility study.

The Project will improve flow conditions in San Juan Creek by addressing channel instability, poor surface and groundwater quality, potential loss of sand sources for coastal sand replenishment, and declining water supplies. The seawater extraction barrier will reduce salinity in the groundwater and improve offshore stream morphology. Stormwater and recycled water recharge will replenish the groundwater and enhance surface water flows. Adaptive production management will modify the existing groundwater production and treatment facilities following implementation of the extraction barrier and recharge program components. This will ensure proper management of the Basin and surface water. The Project will produce local water supply, decreasing the demand on imported SWP supplies that will result in more surface water to be



available in the Bay-Delta to support the habitats of non-listed species. Therefore, the Project will indirectly improve flow conditions in the Bay-Delta and restore/enhance habitat for species by ultimately reducing imported water demand from the Bay-Delta.

In addition to the issues included under question (1) above, the Project will investigate and examine the nuances of optimizing groundwater production from an aquifer that acts and is designated as an underground flowing stream. Some of the items that will be investigated include:

- The velocity that groundwater travels through this type of aquifer and the impact on detention time
- The ability of this type of aquifer to absorb additional recharge
- Identification of geological constraints to increasing the recharge
- Physical constraints that may exist for maximizing the capture of the “stream” flow
- Development of rule-curve approach to determine how to schedule recycled water recharge and production and maximize yield.

(3) Describe the potential for the project to provide water or habitat for federally listed threatened or endangered species, including description of any specific issues that will be investigated or information that will be developed as part of the Title XVI feasibility study.

According to the USFWS, the Steelhead Trout’s critical habitat occurs in the San Juan Creek. This critical habitat extends from the mouth of San Juan Creek at the Pacific Ocean to approximately 2.6 miles upstream, where San Juan Creek meets the I-5. The proposed Project will provide treated water to support the habitat of this species through additional recharge to the San Juan Basin. The seawater extraction barrier will protect groundwater quality of the Basin. Issues that will be investigated include: land uses as well sites, raw water conveyance and treatment facilities, and Steelhead Trout habitat, and ocean brine disposal. The stormwater recharge will provide habitat protection by increasing groundwater recharge. Issues that will be investigated include: obtaining a diversion permit from the State Water Resources Control Board (SWRCB), land use conflicts for recharge sites adjacent to major storm channels, feasibility of infiltration galleries, acquisition costs for recharge sites, and Steelhead Trout habitat impacts. The recycled water recharge component will provide in-stream recycled water recharge to increase groundwater recharge and surface flow to support habitats. Issues that will be mitigated include obtaining a live stream discharge permit from the RWQCB for in-stream recharge, DPH Health requirements for GRRP projects, land use conflicts for recharge sites, acquisition costs, and in-stream recharge impacts on Steelhead Trout habitat.

For the seawater extraction barrier, the environmental impacts from the construction of wells, conveyance facilities, and treatment facilities will be technically addressed through careful siting of the facilities. Regarding the in-stream recharge facilities for stormwater recharge and recycled water recharge, the construction and reconstruction of berms in San Juan Creek will be carefully considered. Berms used for stormwater recharge will be constructed in October each year and reconstructed during the October through April period as necessary to maximize recharge. The upper reaches of San Juan Creek and the Arroyo Trabuco are Steelhead Trout habitat, and the berm construction and reconstruction process will include consideration of fish passage. Adaptive production is required to comply with the diversion permits held by the SJBA and SCWD and with the interagency agreements. The SJBA will set annual groundwater production limits in the spring of each year based on groundwater levels measured that spring and an estimate of the groundwater storage that spring. These production limits will support habitat and hold until the following spring.



3.6 Evaluation Criterion 6: Legal and Institutional Requirements

The Title XVI feasibility Study will address legal and institutional requirements to implementing the Project. A number of regulatory issues will be addressed during this feasibility Study, including:

- Level of treatment for storm water recharge prior to placing into the Basin
- Level of treatment required for the recharge and recovery of recycled water
- Level of treatment credit for Soil Aquifer Treatment (SAT)
- Underground detention time required for a particular level of infiltration and extraction
- Levels of redundancy required for the infiltration and extraction treatment schemes
- Required revisions to existing diversion permits to include the 1) approval to provide alternative water supplies to the existing overlying producers in lieu of them producing groundwater, 2) right to divert, recharge, and store new stormwater recharge; recover & reuse extracted water, allow production in seawater extraction barrier.

The requirements or barriers that will be addressed for each Project component are presented below. The engineering team will characterize these issues and try to avoid the conflicts through thoughtful design and suggest mitigation approaches when conflicts and constraints cannot be avoided.

- Extraction Barrier Alternatives - Conflicting land uses at well sites, raw water conveyance and treatment facilities; Steelhead Trout and other habitat issues; and ocean brine disposal issues.
- Storm Water Recharge Alternatives - The SJBA will be required to obtain a diversion permit from the SWRCB; there may be land use conflicts for recharge sites adjacent to the major storm channels; infiltration galleries may prove to be unfeasible; acquisition costs for recharge sites may be prohibitively high; and the in-stream recharge projects may impact Steelhead Trout and other habitat.
- Recycled Water Recharge Alternatives – The SJBA will be required to obtain a live stream discharge permit from the RWQCB for in-stream recharge projects; there are DPH requirements regarding the GRRP projects that will need to be met; there may be land use conflicts for recharge sites adjacent to San Juan Creek and Arroyo Trabuco; acquisition costs for new recharge sites may be prohibitively high; and the in-stream recharge projects may impact Steelhead Trout and other habitat.
- Adaptive Production Management Alternatives - Conflicting land uses at well sites, supplemental water supply for affected existing water users, raw water conveyance and treatment facilities, product water conveyance; and compliance with draft DPH GRRP regulations.

3.7 Evaluation Criterion 7: Renewable Energy and Energy Efficiency

The Project will address energy efficiency in the SWP delivery system by reducing demand on imported water supply through increasing local groundwater supply. Energy usage is a major consideration for the State and that which is associated to imported water supply conveyance. If the Project is not implemented, SWP purchases will continue to be required to meet the demands of the SJBA service area. Based on the Natural Resources Defense Council's August 2004 Report, titled "Energy Down the Drain", pumping 1 acre-ft of SWP water to Southern California requires 3,000 kilowatt hour (kWhr) of energy. With the Project, the reduction in SWP deliveries will reduce pumping energy and related costs. SJBA's current water supply is dependent on SWP supplies. Stormwater and recycled water are needed for recharging the groundwater Basin to maintain the groundwater elevation. The San Juan Basin is currently impaired. The region has limited groundwater supplies, and as a result the SJBA members obtain most of its water supply (about 92



percent of potable demands) from imported water sources, which require energy for distribution. Currently all of SMWD's domestic water supply is imported water. The proposed Study will yield 10,000 acre-ft/yr of recharged recycled water, which will save 36 million kWhr of energy that would have been expended to transport an equal amount of SWP water to the region. In addition, the Project design capitalizes on energy efficient through strategic placement of recharge facilities, extraction barriers, and wells in the lower portion of the Basin to utilize gravity flow and decrease energy usage where possible.

3.8 Evaluation Criterion 8: Watershed Perspectives

Points will be awarded based on the extent to which the proposal demonstrates that the Title XVI feasibility study will address alternatives that promote and apply a regional or watershed perspective to water resource management.

The Title XVI feasibility Study will address alternatives that promote and apply a regional and watershed perspective to water resource management through the evaluation of stormwater recharge, recycled water recharge, and groundwater extraction. The seawater extraction barrier and the adaptive management approach are selected components that will also be included in the Study, but not evaluated as alternatives as they have already been determined to be necessary. The Project will benefit SJBA member agencies (SMWD, SCWD, MNWD, CSJC), as well as other agencies in the South Orange County region. Together, the SJBA member agencies serve a total population of approximately 555,000. The member agencies of SJBA receives imported water from MWD through MWDOC to meet the demands of its service area. The study will evaluate management components for the Basin, one of the only groundwater basins in South Orange County, which will produce up to 10,000 acre-ft/year of recharged groundwater from the Basin. SMWD's portion of the study will produce 5,000 acre-ft/year of recharged groundwater. South Orange County relies on imported water for over 90% of its supply. The Study alternatives will address water resource management to enhance the water supply reliability for Orange County, supporting the Southern California regional plans of its imported water supplier, MWD. The study will look at the potential resources available to the region and watershed such as the use of stormwater and recycled water in small basins with impaired groundwater quality. The proposed Project is an effort to enhance the production of potable water from the groundwater Basin, creating a local, reliable supply. The regional reliability is expanded by recharging from multiple sources and by providing protection through extraction. The concepts, developed with regulatory oversight, can provide the basis for planning increased local water production throughout the watershed. The enhanced stormwater recharge and the addition of recycled water recharge will provide for a significantly improved reliability of local water supply regardless of climatic conditions.

The Project is regionally supported by the members of the SJBA and is included in the SJBGMFP (San Juan Basin Authority, 2014), which evaluates the management of the San Juan Basin from the San Juan Creek Watershed perspective. This Project is also supported by the South Orange County Integrated Regional Watershed Management Plan (IRWMP)(OC Watersheds, 2013), the San Juan Watershed Management Plan (OC Watersheds, 2002) and the San Juan Creek Watershed Management Study F-5 Report (County of Orange and Army Corps of Engineers, 2002) by addressing the watershed's channel instability and general degradation of the environmental resources and habitat, poor surface and groundwater quality, declining local water supplies, and potential loss of sand sources for coastal sand replenishment. According to the USFWS, there are five critical habitats that occur within SJBA service area, which are evaluated in the Project components. The Project considers the Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) for the Central and Coastal Subregion of Orange County California. The NCCP/HCP



coordinates land management activities of public and private landowners within the 37,000 acre reserve system, conducts wildlife and habitat research and monitoring, and restores disturbed habitats. The Project also supports the Southern California Steelhead Recovery Plan (National Oceanic & Atmospheric Agency (NOAA), January 2012) by protecting the Steelhead critical habitat within San Juan Creek. This critical habitat extends from the mouth of San Juan Creek at the Pacific Ocean to approximately 2.6 miles upstream, where San Juan Creek meets the I-5. The Project's extraction barrier is supported by the Salt and Nutrient Management Plan (South Orange County Wastewater Authority, 2014), which identifies the salinity considerations for the San Juan Creek Watershed and discusses the impaired groundwater with a high TDS concentration. The proposed Project promotes and applies a regional and watershed perspective, as demonstrated through the various plans for water resource management is supports.

4 Technical Proposal: Required Permits or Approvals

No permits or approvals are required for the development of the proposed feasibility study.

5 Technical Proposal: Funding Plan and Letters of Commitment

Table 2 below shows the summary of funding sources.

Table 2. Summary of Non-Federal and Federal Funding Sources

Funding Sources	Funding Amount
Non-Federal Entities	
1. Santa Margarita Water District	\$227,880
<i>Non-Federal Subtotal</i>	\$227,880
Other Federal Entities	
1. None	\$0
<i>Other Federal Subtotal</i>	\$0
Requested Reclamation Funding:	\$225,000
<i>Total Study Funding:</i>	\$452,880

Describe how the non-Reclamation share of study costs will be obtained. Reclamation will use this information in making a determination of financial capability.

SMWD will obtain the non-Reclamation share of study costs from both its General Reserves and a portion of its upper tier water rates dedicated to water conservation and reliability to meet its cost share requirements.

- (1) Describe any in-kind costs incurred before the anticipated study start date that you seek to include as study costs.



- (a) What study expenses have been incurred: The 2013 San Juan Basin Groundwater and Facilities Master Plan (SJBGFMP) was completed. Additional costs include managing the SJBGFMP efforts and identifying possible funding sources to fund the next level of feasibility study.
 - (b) How they benefitted the study: The SJBGFMP benefitted the study by developing alternatives and identifying the issues that need to be further researched. The identification of possible funding sources has assisted in progressing to the next level of required study.
 - (c) The amount of the expense. The 2013 SJBGFMP had total expenses of \$219,945.86, not including “in kind” costs.
 - (d) The date of cost incurrence. The cost of the incurrence was from 2012 through 2014.
- (2) Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment. No funding partners are required for progressing with this additional study.
 - (3) Describe any funding requested or received from other Federal partners. No funding has been requested or received from other Federal partners.
 - (4) Describe any pending funding requests that have not yet been approved, and explain how the study will be affected if such funding is denied. None.

6 Technical Proposal: Official Resolution

The official resolution is scheduled to go to SMWD’s Board of Directors on May 16, 2014. The signed resolution will be submitted up to 30 days following the May 16, 2014 board adoption.



7 Budget Proposal

Table 3 Budget Proposal

Budget Item Description	COMPUTATION		Quantity Type	TOTAL COST
	\$/Unit	Quantity		
Salaries and Wages				
Dan Ferons, General Manager	123	100	hours	\$12,300
Don Bunts, Program Manager	103	200	hours	\$20,600
Nena Parpana, Accountant	40	250	hours	\$10,000
Fringe Benefits - N/A				\$0
Full-Time Employees				\$0
Part-Time Employees				\$0
Travel - N/A				\$0
Equipment - N/A				\$0
Supplies/Materials - N/A				\$0
Contractual/Construction				\$0
Groundwater Management Consultant	150	1766	hours	\$264,900
Soto Resources, Grant Management Consultant (Reporting)	130	416	hours	\$54,080
P. Ravi Rawshanker, Project Manager Consultant	175	520	hours	\$91,000
Other				\$0
				\$0
Total Direct Costs				\$452,880
Indirect Costs - 0%	0	0		\$0
	0	0		\$0
Total Study Costs				\$452,880

Table 4 Funding Sources

Funding Sources	% of Total Study Cost	Total Cost by Source
Recipient Funding	50%	\$227,880
Reclamation Funding	50%	\$225,000
Other Federal Funding		\$0
TOTALS	100%	\$452,880



8 Budget Narrative

The budget narrative provides a discussion of, or explanation for, items included in the budget proposal. The types of information to describe in the narrative include, but are not limited to, those listed in the following subsections.

8.1 Salaries and Wages

The key personnel are listed in the budget Table 3 above, including their name, title salaries and wages, estimated hours, and rate of compensation proposed. The assigned tasks for each personnel are shown below:

- Dan Ferons, General Manager – Tasks 1.1, 2.1, 2.2, 2.3, 2.4, 2.5, 3.3, 3.4, 5
- Don Bunts, Chief Engineer, Program Manager – Tasks 1.1, 2.1, 2.2, 2.3, 2.4, 2.5, 3.3, 3.4, 5
- Nena Parpana, Accountant –invoice processing - All Tasks.

The salaries and wages are based on the SMWD employee compensation as reported to the California State Controller’s Office for 2011. SMWD employee salary ranges and benefits are subject to a memorandum of understanding (MOU) that is approved by District’s Board of Directors. The current MOU is in effect July 1, 2013 through June 30, 2017.

8.2 Fringe Benefits

Not Applicable.

8.3 Travel

Not Applicable.

8.4 Equipment

Not Applicable.

8.5 Materials and Supplies

Not Applicable.

8.6 Contractual

The consultants are listed in the budget Table 3 above, including their name, title salaries and wages, estimated hours, and rate of compensation proposed. The assigned tasks for each consultant are shown below:

- Wildermuth Environmental, Groundwater Management Consultant – Tasks 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.2, 4.3, 5.0



- Soto Resources, Grant Management Consultant (Reporting) – Tasks 2.4, 3.3, 5.0
- P. Ravi Ravishanker, Project Manager Consultant - Tasks 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.2, 4.3, 5.0

The budgeted costs for the consultants were determined to be fair and reasonable based on previous and existing contracts with SMWD to perform related work in the field of expertise. The identified consultants have previously completed work with SMWD and its staff on this project directly or very similar projects related to the proposed feasibility Study.

8.7 Reporting

Reporting will be completed by the consultant identified under 8.6 Contractual and described below:

- Soto Resources, Grant Management Consultant (Reporting) – Task 1.2

Soto Resources will prepare the following reports:

- SF-425 Federal Financial Report, on a semiannual basis.
- Program Performance Report, on a semiannual basis.
- Final Report, upon Project completion.

8.8 Other

Not Applicable.

8.9 Indirect Costs

Not Applicable.

8.10 Total Cost

Indicate the total amount of study costs, including the Federal and non-Federal cost-share amounts.

The total amount of study costs, including Federal and non-Federal cost-share amounts is \$452,880, as shown in Table 4.

9 Budget Form SF 424A

Submitted electronically via grants.gov.